Such a difference of weight is therefore excluded, unless, indeed, hitherto unsuspected thermal effects accompany a rising or falling against or with gravity. It is scarcely necessary to say that we are not here concerned with the differences of temperature and pressure which may actually be met with at different levels over the earth's surface.

There are many chemical transformations which cannot easily be supposed to take place reversibly. But this, though it might complicate the statement, does not affect the essence of the argument; and the conclusion appears to be general.

If the reasoning here put forward be accepted, it increases the difficulty of admitting the reality of such changes of weight as have been suspected, and it justifies a severe criticism of experimental arrangements. In my former letter I pointed out a possible source of error.

It is to be hoped that the matter may soon be cleared up, for it is scarcely creditable to science that doubt should hang over such a fundamental question. But for my own part I would wish to say that I fully recognise how much easier it is to criticise than to experiment.

RAYLEIGH.

UNIVERSITY COLLEGE AND THE UNIVERSITY OF LONDON.

AN influential meeting was held at the Mansion House on Friday last in support of the fund for higher University education and research in London, with special reference to the incorporation of University College in the University. The Lord Mayor presided, and the company present included many who have contributed to national progress in various ways and are anxious that adequate provision shall be established for future advance.

The appeal made by University College was described in our issue of May 1 (p. 10), and at the same time a brief statement was made of the needs of the University and its Colleges. The University can only become a living organism when the Colleges connected with it are actually part of its being. The incorporation of University College would be the commencement of this desirable development, and the ultimate structure would be on a scale worthy of the greatness of our great metropolis.

We are glad to see that the Duke of Devonshire, in his speech at the Mansion House, made special reference to some of the points to which attention was directed in our article. He explained that though the University of London has statutory powers to teach, it has not the material means of teaching, and cannot take part in the extension and advancement of knowledge until placed in possession of buildings and resources for carrying on the work of higher education. The provision of funds for University College thus means the strengthening of the University itself, for by incorporation the senate would acquire complete control over the whole resources of the College, and would be able to carry on the work of the various departments under better conditions than at present are possible.

The urgent need for liberal endowments for higher education in London was stated in our recent article and has often been put forward in these columns at other times. The educational wants of London are, indeed, almost a discredit to the rich citizens, and the inadequate provision made for higher education generally shows that the State does not realise the importance of such studies as factors in national progress. But though the State does little or nothing for those who are making knowledge, the Duke of Devonshire expressed himself as aware of the value of extending the resources of education and research, and other speakers at the Mansion House (including the Lord Mayor) took the same view. Referring to the necessity of giving greater consideration than has hitherto been done to the requirements of the country in this respect, the Duke of Devonshire said:—

"Within the last half-century the gigantic strides which have been made in the discoveries of science have brought about great changes in our requirements as to higher education. It is now recognised that in all professions and industries success must be dependent on a knowledge of scientific principles and on the trained capacity to apply those principles. The Universities are no longer a necessity for one class alone, but the welfare of the whole nation demands that we should seek through all classes men of high intelligence, and, having found those men, that we should equip them with the highest training. These changes in the requirements of higher education found us in this country to a certain extent unprepared. As a nation we cannot be said to have been quick to recognise the necessity of corresponding changes in our higher University training. The older Universities of Oxford and Cambridge have recognised the necessity and have made great efforts to equip themselves with the necessary machinery, but they have found themselves hampered by a want of the necessary resources.

"But, even if complete satisfaction could be given to the claims of the older Universities, still that would not suffice for our national necessities or meet the requirements of present conditions. Our success as a nation depends upon the possession of trained brains, and these we cannot get in sufficient number from any one class, and the older Universities cannot supply the number of trained men we require for our national industries. In all the great towns and industrial centres, University institutions properly equipped and properly endowed are now a necessity, and this need has already received a considerable amount of local expression. I need only give you the instance of the University of Birmingham and the movement which is now taking place in Liverpool for the establishment of a separate University there. But in London, owing to its size and the absence of what may be called local patriotism, the University movement has up to the present time failed to receive that support which might be expected from the wealthiest city in the world. But now, to-day, an opportunity is afforded to the citizens to repair any past neglect, and to create for London a University which shall be worthy of the capital of the Empire and adapted to the special needs of the metropolis of the Empire."

Resolutions were afterwards carried in support of the scheme of incorporation, and urging citizens of London to make a generous response to the appeal for one million pounds to endow and equip University College with a view to its incorporation. It remains to be seen whether London is sufficiently jealous of its honour and supremacy to make the University bearing its name rank with those of Europe and America.

THE CULTURE OF GREENHOUSE ORCHIDS.[1]

BEFORE passing judgment on a work of this kind it is only fair to the author to attempt to ascertain his object in writing it, so that a fair conclusion may be arrived at as to how his object has been attained and the use of the resultant work to those who consult it, for that is the main consideration.

In the first few lines of the preface, Mr. Boyle very definitely gives his reason for writing the book. He says: "The literature of orchidology is voluminous in these days. But a book written 'by an amateur for amateurs' is still needed." That was a very good reason. Every new work on orchids, or on any other special subject, tends to increase the knowledge and growth of the subject dealt with, and as the devotees to orchid culture are mainly recruited from the amateurs commencing in a small way, a work written by an amateur, and especially by such a pleasant and entertaining writer as Mr. Boyle, who has the art of conveying instruction with amusement, must be of the highest value.

[1] "The Culture of Greenhouse Orchids." By Frederick Boyle. Pp. xii + 231. (London: Chapman and Hall, Ltd., 1902.) Price 8s. net.

The handy little volume, extending over two hundred and thirty pages, has three excellent coloured plates and fifty illustrations of single flowers of cool-house orchids,

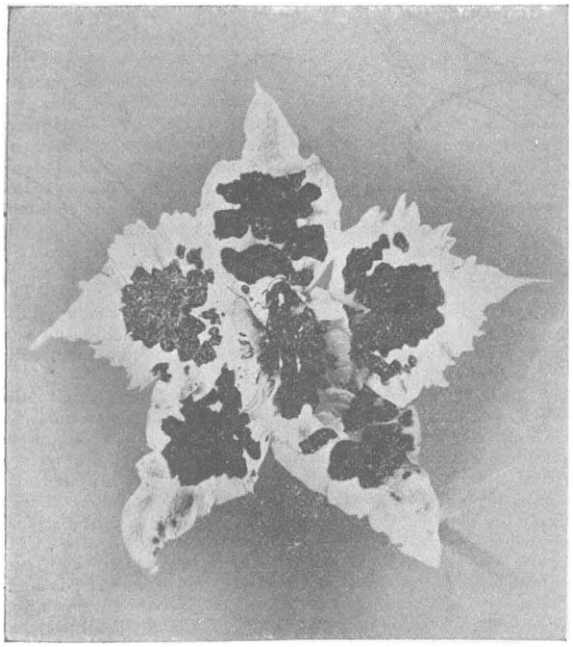

FIG. 1.—Odontoglossum Crispum Pittianum, showing the widest departure from the normal white form. The sum of 750*l.* was offered for this plant.

reproduced from photographs by Colonel F. C. Taylor. The book, though useful as a work of reference, will be found to give the best results to the amateur just beginning orchid culture, or who has been pursuing it with indifferent results, if he repeatedly peruse it from beginning to end. Thus he will have a sound basis on which to continue his work, freed from the struggles and failures which the unaided amateur must expect, and the sorrows the past experience of which Mr. Boyle justly advances as a reason why he should be able to write a book which would be useful to those who contemplate following him as amateur orchid cultivators—a pastime of the greatest interest and pleasure if reasonably followed.

The work opens with six lengthy and instructively written articles, setting forth the general principles of orchid culture and matters relating to it, after which throughout the remainder of the work follow the enumeration of the genera and species suitable for culture in the greenhouse, together with cultural remarks and much information relating to each, all of which, having passed the scrutiny of that well-known and clever expert, Mr. Joseph Godseff, have a sufficient guarantee of excellence.

On testing the question ample proof is obtained. If but for the articles on *Coelogyne cristata* and on Oncidiums for the cool-house, the perusal of the work might well be recommended. In the case of *Coelogyne cristata*, one of the most beautiful and easily grown orchids when treated as Mr. Boyle advises, there are few species which give more unsatisfactory results to the budding amateur growing it by his own judgment. Even experienced growers in large establishments often have their plants with the shrivelled bulbs which are cited as to be avoided by the method prescribed. In the matter of the Oncidiums enumerated, the mere direction that they are to be grown in a cool-house is almost sufficient to ensure success, for they are more often than not grown in too high a temperature and killed in consequence. And so on throughout the book; even the enumeration together of the species which can be successfully grown in a greenhouse, to say nothing of the excellent cultural details, makes it of great value, for it saves the amateur from attempting things which require more heat than he can give—a mistake which causes many small amateur collections to look shabby and annoy and disgust the owner, who has probably taken more pains to bring about that undesirable state of things by working on unsuitable subjects than he need take to ensure a delightful success on the lines set forth in Mr. Boyle's book.

But from the critic the book calls for some remarks on points which luckily do not much interfere with its general usefulness. In the preface and following articles, Mr. Boyle makes much of his desire to advance the new Belgian culture of orchids in oak-leaf mould, or terre de bruyère, but in the progress of the work he only places it as an alternative method, wisely placing the well-tried British method of potting in peat fibre and sphagnum moss in the first place. It should be remembered that there is a vast difference between the Belgian collections, with large numbers of a few species only, and many of the British collections, which include a few of each of a large number of species. Then there are climatic and other differences; and above all it should be said that one of the largest and oldest and some of the smaller Belgian orchid growers, after experiment, will have nothing to do with it. In Great Britain the question is on trial, and while in some places there are excellent specimens grown in leaf-soil, in others it has been tried and abandoned.

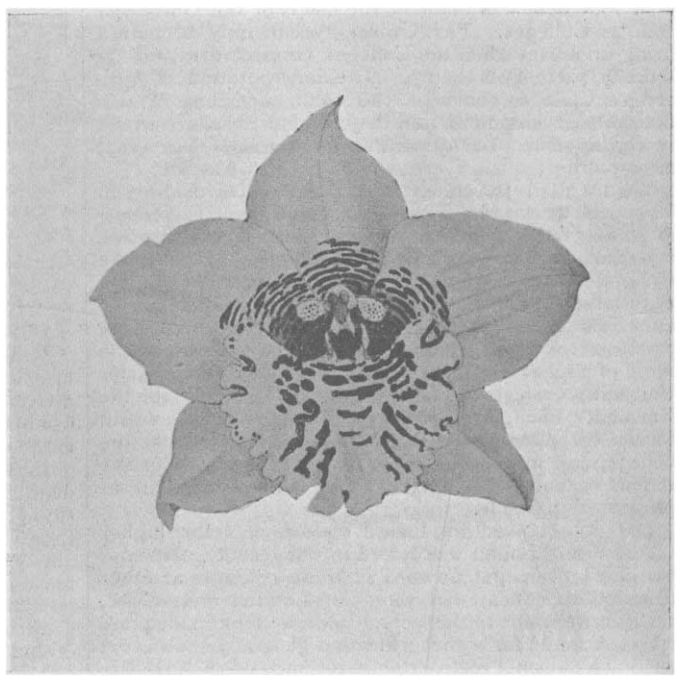

FIG. 2.—Odontoglossum Cervantesii Decorum.

Again, when touching on the use of manures something more definite than general remarks might have been used—the "yea or nay" promised in the preamble—or the

small amateur who is induced to experiment will surely find himself in trouble.

In the chapter "Orchid Names," the author follows the popular lead by finding fault with the existing orchid nomenclature, and with the inevitable result that he is unable even to hint at a better method than that for which we have to thank a long line of patient and clever men who have been working on the subject in all ages since the classification of plants began. It should be remembered that the question is not as to whether the name is good or bad Latin or Greek, expressive or not expressive, but that it is intended as a means of identifying the plant in every civilised quarter of the globe, an end which no system of popular names could accomplish, but which has worked under the present system of scientific names in a marvellously satisfactory manner. To apply it to his own case. Deprived of the scientific names he finds fault with, Mr. Boyle's book would have been impossible in its present useful form.

Orchid culture cannot be reduced to an exact science. Each operator has to adapt his methods to his convenience, but in order to know how to meet his difficulties and to overcome them, Mr. Boyle's book will be found invaluable. In some cases the prices at which the plants may be obtained are also given.

THE ROYAL VISIT TO THE UNIVERSITY OF WALES.

THE installation of the Prince of Wales as the second Royal Chancellor of the University of Wales is associated with an important epoch in the development of university education in North Wales. When the University College of North Wales was founded in 1884, it would have been difficult to find a more ideal situation for a centre of university education than the Penrhyn Arms Hotel at Bangor, which possessed ample accommodation for existing requirements. But eighteen years ago, Hertz's realisations of Maxwell's theory of electric oscillations, culminating in wireless telegraphy, did not exist; the existence of Röntgen and other rays had not been anticipated; no argon was known to exist in our atmosphere, no helium in our earth; the liquefaction of the more permanent gases was regarded as a mere classical experiment, impossible on a large scale; even in mathematics, the fertile theory of groups was almost untrodden ground. Taking also into account the increase in the number of students in the eighteen years from 55 to 320, it is small wonder that new buildings with more modern equipments have now become indispensable for the further progress of the College. These needs bid fair to be soon met by the recent generous gift on the part of the City of Bangor of a new plot of ground 10·6 acres in extent, about 6·6 acres of which are available for building purposes, on a site which, in the opinion expressed by Principal Reichel, "any university College in the kingdom might well envy." This gift represents, for the City of Bangor, the equivalent of a gift of one million pounds from the citizens of a wealthy town comparable with Liverpool.

The smallness of the population of Bangor and the absence of the large wealth-producing industries of our midland towns are a sufficient guarantee that the new College need never fear the disturbing influences of electric trams and the smoke and din of factories which have afforded such an obstacle to scientific research in wealthy and thickly populated manufacturing centres.

The University congregation was held, not at Bangor, but at Carnarvon, where the large pavilion had been transformed into a senate house. The lavish display of bunting at Carnarvon and subsequently at Bangor; the gowns and hoods of graduates, extending over the whole range of colours from violet to red, and the presence of large contingents of students from Aberystwyth, Bangor and Cardiff, including a considerable proportion of "sweet girl undergraduates" in caps and gowns, all contributed to the festivity of the scene. Even the mountain ranges of Snowdonia were clad in white hoods of snow rarely seen in May. The actual installation ceremony having been completed by the presentation of the key of the University seal and a copy of the statutes to the Prince as Chancellor, addresses were read by Dr. Isambard Owen and Principal Roberts on behalf of the University court and senate, and addresses were also presented or read on behalf of several other bodies, including the guild of graduates. The Prince in reply, after referring to the work done by teachers and students of the Welsh University, laid special stress on the encouragement given to post-graduate and scientific work, and the fact that it is by the work done in after life by its graduates that the reputation of a university is really made. The Chancellor then admitted the Princess of Wales to an honorary degree in music and proceeded to the conferment of honorary degrees, in which science was represented by the Earl of Rosse, the recipients being presented by Vice-Chancellor Roberts, of Aberystwyth. The intervals in the proceedings were filled by part songs sung by a well-trained choir, and at the conclusion the problem of transporting the guests to Bangor was solved with remarkable success. Here luncheon was laid for six hundred and fifty in a marquee pitched close to the new site, under the chairmanship of Lord Kenyon. In his speech, the Prince of Wales once more struck a chord which he had already sounded at the National Physical Laboratory in referring to his recent tour and his experience of the work done in universities across the seas in bringing intellectual ability to the front and rendering it available for the public service. This line of thought was ably echoed by Principal Reichel in his remarks that "The idea, which at one time was not uncommon, that intellectual training is unfavourable to action is now happily becoming discredited at home; on the Continent it has long ago perished. . . . The function of provincial university colleges is, in short, to train up a more vigorous and efficient race, fitted to meet the heavy demands which the course of world events is making on the inhabitants of these islands, a race of more efficient thinkers, of more efficient workers, and if the necessity should arise, of more efficient fighters." Principal Reichel further announced the receipt of an offer of twelve scholarships of 30*l*. for three years from Sir Alfred L. Jones, of Liverpool. It was also announced that the town of Cardiff, like Bangor, has presented its University College with a new site.

The next item was the visit of the Prince and Princess to the present College, where a guard of honour was formed by the College volunteer corps. Interest naturally centred round the museums and laboratories. The College possesses a very fair zoological museum, and it is proposed to establish in connection with the same department a marine station where problems connected with the fisheries of the North Wales coast can be studied systematically. Already efforts have been made to arouse interest in the fishing industry by popular lectures. Most of the work of the College in agriculture has been hitherto carried on at a farm right away near Llangefni, but the College is now indebted to Colonel Platt for an experimental farm in a much more accessible situation near Llanfairfechan. Of other recent developments on the science side, we note the Drapers' Company's temporary endowment of a school of electrical engineering, a school which is bound to develop when a university training is, as it should be, insisted on in this country as an indispensable qualification for every electric engineer. The organisation of a department of mining is also, thanks to the support of local bodies, approaching completion. A recent gift from Mr. George Rae for the purpose of